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**PRESIDENTIAL ADDRESS**  
**RETURN OF PARASITIC DISEASES**

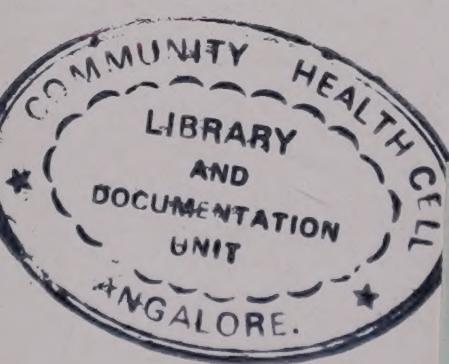


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## RETURN OF PARASITIC DISEASES

I have great pleasure in welcoming the invited guests and delegates to the 12th National Congress of Parasitology being held in this beautiful city of Panaji, Goa. The city of Panaji is one of the most beautiful cities of our country and a tourist attraction. I hope you would be able to enjoy your stay and visit some of the memorable monuments and sea beaches. I also wish to express my gratefulness to the Indian Society of Parasitology for electing me as President of the Society, and for continued support given to me in organizing various activities of the Society.

Parasitic diseases affect more than 1 billion population of the world. A World Bank study reported that infectious and parasitic diseases account for well over half the total burden of morbidity and mortality in the continents of Africa and Asia excluding China. It is also noteworthy to mention that 90% of the global disease burden occurs in tropics whereas only about 5% of global health and development investment is directed to reduce that burden. Parasitic diseases are also unevenly distributed. For example in the tropical Africa 10% of the world's population suffers from 90% of the world's malaria infection. Common endemic diseases in India are Malaria, Filariasis, Leishmaniasis, and

Dracunculiasis (Guinea worm disease), but we are lucky not to have Chagas' disease, Schistosomiasis (Bilharzia, Snail fever), and Trypanosomiasis (Sleeping sickness). Among the other vector borne diseases India is spared of Yellow fever but Japanese encephalitis and Dengue Hemorrhagic fever have entered the country.

During the 11th congress of parasitology held at Udaipur in February last year I had voiced my concern on the high incidence of parasitic diseases and our limited efforts to cope with these problems. In the year that has elapsed, we have witnessed the return of plague followed by the epidemic of malaria in western Rajasthan and Manipur. I had also spoken to you about the role of the Indian Society for Parasitology in furthering and disseminating the knowledge in parasitology, and the important role parasitologists can play in our fight against the prevalent parasitic infections of man and animals; the need to diversify research by involving other disciplines for better understanding of the biology of parasites, host parasite interaction, transmission dynamics and control. My main concern today is the return of malaria, kala azar, dengue fever, invasion of dengue hemorrhagic fever and dengue shock syndrome, increasing incidence of filariasis, diarrhoeal diseases, and a host of other parasitic infections. There are a few obvious questions that must

be addressed. How is it that with the advancement of knowledge on these diseases we are witnessing their return with vengeance ? How do we re-organize ourselves in combating these diseases? and finally what can the Society do to help control or eliminate these diseases ? But before we discuss these important issues, I would briefly like to highlight the status of some of the parasitic diseases causing widespread concern.

Malaria has returned with vengeance and its control has become problematical requiring new approaches and sustained interventions. In the good old days malaria was a well known killer disease with high morbidity. Malaria prevented the development and harnessing of natural resources, and destroyed the economy of the country. It may be noted that before the National Malaria Control Programme was launched in the country in 1953, malaria was mainly a rural disease except some limited transmission in urban areas. Seen in that background malaria today is a serious problem in the urban areas, and a rising trend is being witnessed due to ecological changes promoting the breeding of vectors.

Return of malaria is also characterized by the establishment of many new malaria paradigms such as the irrigation malaria, industrial malaria, urban and peri-urban

malaria, migration malaria, and tribal or forest malaria. Malaria transmission in these ecologically diverse situations requires to be addressed differently for a meaningful offensive. In the last 4 to 5 decades malaria epidemiology has also changed as is evidenced by the ecological succession of malaria vectors, refractory nature of vectors to control operations including the physiological resistance to insecticides, vast areas showing high receptivity promoting the proliferation of vectors and their sub species, changes in the parasite formula in favour of *Plasmodium falciparum*, resistance to antimalarial drugs in the malarial parasite *Plasmodium falciparum*, and above all our capacity to fight the disease is diminishing due to inadequate man power and management problems, cost escalation of insecticides and field operations, and pronounced social problems faced during implementation. The overall scenario is therefore a deteriorating malaria situation as reflected by rise of malaria cases in 1994 in the states of Karnataka, Arunachal Pradesh, Assam, Jammu and Kashmir, Tripura, Rajasthan, Manipur and Nagaland. Unfortunately malaria situation is deteriorating globally killing 1-2 million people world wide. WHO experts say that the number of infected people worldwide is increasing at the rate of about 5% annually. There are no simple and universal methods to control malaria. The strategy of malaria control demands the application of selective and sustainable vector control strategies.

Malaria control in the present context of changing environment also demands more inputs, better organization, scientific approach to control based on the local determinants, and sustained integrated interventions. It is relevant here to speak to you about epidemic situations in regard to malaria in Panaji city. Malaria was not known in this city before the early 1980s. There used to be less than 10 cases of malaria and suddenly malaria cases started to multiply and reached a peak of several thousand cases per year with the pronounced problem of *P. falciparum*, deaths due to malaria were reported and parasite resistance to antimalarials started to surface. In those days there was a total confusion and malaria was a serious public health problem threatening the economy of the state which depended on the tourist flow. Application of scientific methods of malaria control on sustained basis and systematic application of bioenvironmental methods curtailed transmission and brought malaria under control. But malaria control requires sustained vigilance and constant check on the interventions, otherwise malaria has a tendency to strike back with much strong vigor creating confusion and killing people. You would be happy to note that work done in Goa on malaria control is a success story for the entire country and this model can now be replicated in other parts of the country for malaria control. The spread of malaria in the country is basically the result of man made changes

conducive for mosquito proliferation largely created by the water accumulation and poor drainage, and unless we address these basic problems success in malaria control on sustained basis is rather difficult.

Let us take the case of diseases caused by the 4 types of dengue viruses. These viruses are transmitted by the mosquito *Aedes aegypti*. This mosquito breeds in containers, desert coolers, discarded containers, tyre dumps etc. and these habitats are increasing due to urbanization, and in rural areas due to piped water supply. Prolific breeding of *Aedes aegypti* has resulted in the spread of dengue fever and related complications, and since the environment is becoming more and more hospitable for mosquito breeding, the disease is invading new towns and villages. This problem is global and not specific to India. The WHO therefore has taken a serious note of this emerging problem and the forty-sixth World Health Assembly passed a resolution in May 1993 urging member countries to control dengue worldwide.

The problem of filariasis is one of the most neglected problems, perhaps because the disease does not kill but disfigures. In India there are c 25 million microfilaria carriers of *Wuchereria bancrofti* and c 16 million people suffer from the disease. The problem of filariasis is still not fully delimited. Within the human host control

of microfilaria is possible but the adult worms are not amenable to control. This parasitic infection is transmitted by the ubiquitous mosquito *Culex quinquefasciatus*. The vector breeds in polluted waters and due to inadequate drainage in rural and urban areas, populations of this mosquito have multiplied enormously creating high nuisance and enhancing disease transmission. Unfortunately the disease is entering new areas due to high humidity created by excessive water stagnation on permanent basis. The National Filaria Control Programme (NFCP) is confined to urban areas and the problem in rural areas is not even addressed.

In the 1950s and 1960s spraying of residual insecticides produced collateral benefits and as a result kala azar and plague were almost eliminated. Kala azar now afflicts large population in Bihar. Kala azar is a killer disease, has a long incubation period and gives protracted illness. Treatment is expensive and parasitological cure is difficult. The disease which had a focus in a few districts in north Bihar, and from there it has gradually spread to almost the entire state of Bihar, eastern Uttar Pradesh and west Bengal threatening to engulf more areas, if not controlled. *Phlebotomus argentipes*, the sandfly is susceptible to insecticides, particularly DDT but still the disease is finding new areas for invasion. A similar situation exists in our neighbouring countries of Nepal and Bangladesh.

One root cause of the increasing trends in parasitic diseases is the increase in population and shrinking natural resources. Our population increased from 439 million in 1961 to 844 million in 1991 and it is likely to cross 1 billion mark about the turn of this century. The process of urbanization is adding new dimensions to the transmission of these diseases. Urban agglomerations have increased from 2590 in 1971 to 3768 in 1991. At the time of first census after the independence in 1951 the population living in towns was 62.44 million and in 1991 the urban population was 217.18 million. The urban population is doubling in about 2 decades and the percentage of urban population is already 25.72. Population pressure is resulting in the shortage of housing, high human density per square kilometer, outstripping our capacity to manage water, widening gap in demand and supply of water, lack of drainage and wherever drainage is present it is inadequate and improperly maintained, solid waste accumulation, mushrooming of hutments, inadequate health infrastructure and many associated problems. Even in rural areas population pressure is causing similar problems. In order to cope with the demands of increasing population various developmental projects have been launched since independence, but some of these projects have brought in new problems of parasitic diseases by providing additional breeding grounds for the vectors thus enhancing disease transmission.

Control efforts directed against the vectors and their parasites have resulted in the selection of resistant genotypes like in the case of *P. falciparum* and now reports of resistance in the *Leishmania donovani*, and almost all mosquito vectors show some degree of resistance. Even in case of sandflies there are reports of resistance to DDT, but still this problem is very limited and does not interfere with the field operations. To control vectors ecological approaches that prevent vector breeding should be the rule rather than exception. Insecticides should be used selectively and only wherever indicated to tackle special situations or fight the epidemics. The approach to disease vector control should be flexible, and local talents and resources should be fully exploited and health education, community participation and intersectoral collaboration should become the backbone of intervention strategies. Such an approach to the control of vector borne diseases would extend the useful life of the insecticides and vector control operations will be sustainable and cost effective. Implementation of such a strategy would require decentralized planning bringing decision making more near the problem areas, re-orientation of the health services, and training.

In the context of new challenges posed by the parasitic diseases and using the existing health infrastructure it is important to carve out a role for the Society, whose objective would

be to help the communities in the prevention, control and proper treatment of some common parasitic diseases with their limited resources. There is abundant information available on the parasites of man and animals, their biology, pathology, epidemiology, preventive methods, treatment, and control of transmission. This knowledge is sufficient for the communities in avoiding to contract these diseases. In this connection I would like to give some examples of simple and sustainable strategies for disease vector control. These are the filariasis control by the expanded polystyrene beads and diethyl carbamazine (DEC) medicated salt, control of dracunculiasis by the use of water filtered through the cheese cloth and installation of the bore hole wells, malaria control by the use of insecticide impregnated bed nets, application of neem oil to repel mosquitos and sand flies and thus reduce transmission of malaria and Leishmaniasis, and application of bioenvironmental methods to prevent mosquito production. What we lack is the dissemination of these simple and low cost technologies to the masses. The society therefore should take a leading role in this neglected area by providing health education to the masses. To create awareness about the important field of parasitology we have organized two seminars during the current Congress, one in Hindi and the other one in Konkani. The Society is already publishing a scientific journal, the Indian Journal of

Parasitology and we need to improve its quality both in scientific content and production. There is a need to organize more symposia, seminars, and workshops in various parts of the country on topics of topical interest. Recently a 2-week workshop on the cultivation of parasites was organized by the Society at the Central Drug Research Institute, Lucknow. Recent advances in modern biology offer immense opportunities in the basic and applied research. We all know the excitement generated by the progress made in the human genome project, and I would like to highlight the fact that genetic blue print of important human pathogens and parasites is also being deciphered almost simultaneously. A 6-month project has been launched to sequence DNA of the *Helicobacter pylori* a causative organism of stomach ulcers and cancer. Sequencing of the genome of *Mycobacterium leprae* would be completed within two years. Mapping of the genome of *Leishmania*, *trypanosoma brucei* and *Toxoplasma gondii* is starting soon. A 3-year project on genome mapping of the malarial parasite *P. falciparum* is already underway, and a genome project to map five major tropical disease organisms will start soon under the auspices of the Tropical Disease Research (TDR) programme of the World Health Organization (WHO). Many more new technologies are emerging inter alia in diagnostics, immunization, chemotherapy, and vector control. These advances



will provide scientists and public health specialists a strong scientific base for a more cost effective and sustainable control of parasitic infections, and thus provide an equitable environment for healthy body and mind.

Ladies and gentleman I would like to conclude my address at this optimistic note. I take this opportunity to thank Dean, Medical College, Goa his faculty and students; Director, Health Services, Goa; Local Organizing Committee and other institutions for the excellent arrangements made for the Congress. I wish the 12th National Congress of Parasitology a success and fruitful deliberations.

Thank you



